Bornean *Rhynchosuchus Schegelii*, as also in the form of the palato-nares. From the combination of characters presented by these Crocodiles (which the author regards as representing two species of *Goniopholis*) and their geological age, the author proposes to place them in an intermediate subgroup, which may be designated Metamesosuchia.

MISCELLANEOUS.

On the Classification of the Stellerida.

By M. C. Viguier.

In the various classifications of the group Stellerida, authors have chiefly made use of characters furnished by the external skeleton and the various accessory products, spines, granules, &c. which cover it. It appears to me that, without neglecting the data furnished by their examination, more precise characters may be derived from the teeth themselves and the internal parts of the skeleton, particularly the interbrachial arches and especially the piece which supports the teeth and which I therefore name the *odontophore*. The interbrachial arches have been figured in some genera, but the odontophores have never attracted particular attention; and, finally, it was not known that in the ambulacra of some Stellerida there are circlets of calcareous spicules analogous to those found in Echinoida, although not presenting the same regularity.

Such investigations cannot be conclusive unless they apply to a great number of genera. M. Perrier placed at my service all the disposable duplicates of the collection of the museum, and I have also been able to study several types in the living state at M. Lacaze-Duthiers's laboratory of experimental zoology at Roscoff. I have thus brought together thirty-seven species belonging to twenty-seven genera distributed in the different families; and the following are the results at which I have arrived.

In the first place we recognize the great and profound separation between the Asteriadæ on the one hand, and all the other families of the group on the other. In all the Asteriadæ the teeth are absolutely truncated on the mouth-side, and repose by a flat surface upon the odontophore, which is massive and presents on its lower face a double inclined plane in relation to the teeth. The latter, therefore, considering the extent of the surfaces in contact, can have little or no movement. The types examined are *Asterias glacialis*, *Stichaster aurantiacus*, *Pycnopodia helianthoides*, and *Heliaster helianthus*, *microbrachia*, and *Kubinyi*. The form of the teeth is the same in all cases, as also that of the odontophore in the first three genera. It therefore does not appear to me possible to separate the genus *Pycnopodia* from this family, as proposed by Mr. Agassiz, and to approximate it to *Solaster papposus*, which differs profoundly from it. In the genus *Heliaster* the odontophore is cer-

tainly the same; but to give more solidity to the oral ring, which is formed of very small pieces, it is soldered to a larger piece situated behind it, and on the oral surface of which it forms a projection which enables it to be easily recognized.

Passing to the other families we find that the teeth, which are more or less stout and more or less pointed, are never absolutely truncated on the oral side, and that, in the general plan of the mouth, they have acquired a preponderance over the first ambulacral pieces, whilst the reverse is the case in the whole family Asteriadæ. The odontophore, which is almost simple in the Echinasteridæ, in which the teeth are very feeble, appears everywhere else composed of a body and two more or less prominent small apophyses having articular surfaces. These apophyses fit into the cavities which result from the coalescence of the first ambulacral and interambulacral pairs; and in this way the teeth, instead of resting upon one plane, are free to oscillate round these apophyses. Peculiar muscles give rise to the movements of separation and approximation of each pair of teeth.

The following are the new groupings that I propose (the names of the species examined are placed in parentheses):—

The genera *Echinaster* (*E. sepositus*) and *Cribrella* (*C. oculata*) belong to the same family (Echinasteridæ), which is clearly differentiated from the rest. The genus *Mithrodia* (*M. clavigera*), which approaches them, must nevertheless, I think, be separated from them and form the type of a family, Mithrodidæ, which also has affinities with the Linckiadæ.

Solaster papposus and *S. endeca*, contrary to the opinion of Mr. A. Agassiz, are certainly two species of a single genus. Their affinities are with *Acanthaster* (*A. echinites*), with which they must form a family (Solasteridæ). The Linckiadæ, from which I separate the genus *Fromia* (*F. milleporella*), are enriched with the genus *Chætaster* (*C. longipes*), which formed part of the Astropectinidæ. A great division must be established in this family: on the one hand the genera *Ophidiaster* (*O. pyramidatus* and *O. ophidianus*) and *Scytaster* (*S. variolatus*); on the other the genera *Linckia* (*L. miliaris* and *L. diploa*) and *Chætaster*. In the former group the pieces that M. Gaudry called "interambulacraires internes," instead of going from the ambulacral piece to the second row from the furrow, pass to the third, the pieces of which are larger: we cannot therefore assign them a serial number.

In the Goniasteridæ there are, no doubt, great divisions to be made; unfortunately I have only been able to examine too limited a number of types. However, I shall separate *Pentagonaster* (*P. astrologorum*), with which I unite *Fromia*, from the rest of the family, in which I leave the genera *Pentaceros* (*P. reticulatus*, *muricatus*, and *turritus*), *Anthenea* (*A. articulata*), *Goniodiscus* (*G. Pleyadellæ*), *Culcita* (*C. Schmideliana*), and *Gymnasteria* (*G. carinifera*). But, I repeat, the study of other genera will introduce new groupings.

The Asterinidæ include *Asterina* (*A. gibbosa* and *A. calcar*) and *Palmipes*. *Palmipes membranaceus* is very distinct; but *P. inflatus* very clearly allies the genus to *Asterina* and even to *Porania* (*P. pulvillus*), which I propose to unite with this family, and which, in the classification of Müller and Troschel, formed, with the *Gymnasteriæ*, the genus *Asteropsis*. The *Gymnasteriæ*, on the contrary, belong, as we have seen, to the family Goniasteridæ, as is shown by the structure of their dentary apparatus and the presence of spicules in their ambulacra.

The Astropectinidæ, reduced to the genera *Astropecten* (*A. aurantiacus*), *Luidia* (*L. clathrata*), and *Ctenodiscus* (*C. corniculatus*), form a very natural family; but we must completely separate from them the genus *Archaster*, or, at any rate, *A. typicus* and *angulatus*, which, for the present, remain perfectly isolated.

I have been unable to study any specimens of the other families, and therefore preserve an absolute silence upon them, except to say that, from an attentive reading of M. Sars's memoir and an examination of his plates, I have arrived at the conviction that, in spite of its two rows of ambulacra and its other peculiarities, the genus *Brisinga* ought to be approximated to the Asteriadæ. Perhaps the odontophore may have undergone some such modification as it presents in *Heliaster*, although the figure does not prove much in this respect, but the teeth are certainly the teeth of Asteriadæ. This would be confirmatory of the opinion which led M. Perrier to believe in the presence in *Brisinga* of crossed pedicellariæ, which he regards as characteristic of the Asteriadæ.—*Comptes Rendus*, March 11, 1878, p. 681.

On the Aerial Respiration of some Brazilian Fishes.

By Prof. Jobert. Report by Prof. Milne-Edwards.

M. Jobert, Professor at the Faculty of Sciences at Dijon, and at present in Brazil, was commissioned by His Majesty Don Pedro to make various zoological investigations in the valley of the Upper Amazon, a region the study of which was commenced some years ago in a brilliant fashion by Agassiz. We have as yet no information with regard to the general results obtained by M. Jobert, who was at Tubatinga, near the frontier of Peru, in the month of September last; but, recently, the Emperor of Brazil has addressed to the Academy, through General Morin, a memoir by this traveller upon a special subject of very considerable interest, namely, the peculiar mode of respiration of several freshwater fishes inhabiting that part of South America.

In a previous memoir M. Jobert had made known the occurrence of an aerial respiration in *Callichthys asper*, a Siluroid fish which inhabits the environs of Rio de Janeiro, and which has the power of living for a long time out of water. Like the common Loach (*Cobitis fossilis*) of Europe, this *Callichthys* frequently swallows bubbles of air, partly absorbs the oxygen from them by the walls of